SPATIAL AUDIO SIGNALING FILTERING

FIELD

[0001] The present application relates to spatial audio signal processing, and in particular, but not exclusively to spatial audio signal processing for use in portable apparatus.

BACKGROUND

[0002] Modern electronic devices enable the user to consume multiple sources of audio and visual content at the same time. Mobile phones for example can be configured to record audio signals using the microphone, video images using the camera, receive real time audio signals and/or audio video streams via a wireless communications network, and replay or recover audio signals and/or audio visual data stored on the apparatus for example on a micro SD card or internal memory of the apparatus. Furthermore it is possible to consume (view/listen to) these multiple sources of audio and visual content at the same time and enable the user to switch or focus on one using the user interface. Thus for example a user can switch between a music MP3 audio stream stored on the apparatus and a streamed television programme received via the wireless network using the user interface to switch between the two sources.

SUMMARY

[0003] Embodiments attempt to address the above problem.

[0004] There is provided according to a first aspect a method comprising: analysing at least one input to determine one or more expression within the at least one input; and controlling at least one audio signal associated with the at least one input dependent on the determination of the one or more expression.

[0005] Controlling the at least one audio signal may comprise at least one of: volume processing the at least one audio signal associated with the at least one input dependent on the determination of the one or more expression; spatial processing the at least one audio signal associated with the at least one input dependent on the determination of the one or more expression; pausing the at least one audio signal associated with the at least one input dependent on the determination of the one or more expression; closing the at least one audio signal associated with the at least one input dependent on the determination of the one or more expression; and playing the at least one audio signal associated with the at least one input dependent on the determination of the one or more expression.

[0006] Spatial processing the at least one audio signal associated with the at least one input dependent on the determination of the one or more expression may comprise spatial processing to the foreground the at least one audio signal associated with the at least one input dependent on the determination of the one or more expression within the associated at least one input.

[0007] The method may further comprise spatial processing to the background at least one further audio signal dependent on the determination of the one or more expression within the associated at least one input.

[0008] Spatial processing the at least one audio signal associated with the at least one input dependent on the determination of the one or more expression may comprise: generating a head related transfer function associated with the at least one audio signal wherein the head related transfer function is dependent on determining the determination of the one or more expression within the associated at least one input; and applying the head related transfer function to the at least one audio signal associated with the at least one input.

[0009] Volume processing the at least one audio signal associated with the at least one input dependent on determination of the one or more expression may comprise volume processing to the foreground the at least one audio signal associated with the at least one input dependent on the determination of the one or more expression within the associated at least one input.

[0010] The method may further comprise volume processing to the background at least one further audio signal dependent on determining the determination of the one or more expression within the associated at least one input.

[0011] Volume processing the at least one audio signal associated with the at least one input dependent on the determination of the one or more expression may comprise: generating a volume level associated with the at least one audio signal wherein the volume level is dependent on determining the determination of the one or more expression within the associated at least one input; and applying the volume level to the at least one audio signal associated with the at least one input.

[0012] Analysing at least one input to determine the one or more expression within the at least input may comprise at least one of: audio signal analysing to determine an audio expression when the at least one input is an audio signal; text signal analysing to determine a text expression when the at least one input is a text input; data signal analysing to determine a data expression when the at least one input is a data input; image signal analysing to determine an image expression when the at least one input is an image input; and video signal analysing to determine a video expression when the at least one input is a video input.

[0013] Analysing at least one input to determine the one or more expression within the at least input comprises at least one of: hidden Markov model analysing; pattern detection analysing; dynamic time warping speech recognition analysing; neural network pattern recognition analysing; maximum entropy Markov model analysing; Bayesian network analysing; tonal analysing; and beat pattern analysing.

[0014] The method may further comprise selecting the one or more expression to be analysed for.

[0015] The method may further comprise generating the one or more expression to be analysed for.

[0016] Generating the one or more expression may comprise: selecting at least one input; selecting a portion of the at least one input; and generating the one or more expression dependent on the portion of the at least one input.

[0017] The at least one input may comprise at least one of: an audio signal; a text input; a data input; an image input; and a video input.

[0018] The method may further comprise receiving the at least one input from at least one of: a memory configured to store a pre-recorded or downloaded file; a transceiver; a receiver configured to receive a transmitted signal; at least one microphone configured to generate a signal based on a sound field surrounding an apparatus; and a sensor configured to generate a signal dependent on a characteristic of an apparatus.

[0019] The one or more expression may comprise at least one of: at least one phoneme; a defined musical note